Council Agenda #6B
Meeting of March 25, 2008

Staff Report

DISCUSSION AND DIRECTION REGARDING THE CITY OF BELMONT'S PAVEMENT MANAGEMENT PLAN

Honorable Mayor and Council Members:

Summary
Staff requests that City Council provide discussion and direction on whether the City should pursue additional funding for the City Pavement Management Program and whether the City should pursue an alternative approach to paving maintenance by bringing slurry seal projects in-house to be performed with Public Works Services staff.

Background
On January 22, 2008, the City Council received an informational report on the City of Belmont Pavement Management Program. The next step is to seek Council direction on proposed funding scenarios that each specify a target average roadway condition and reduce the City's deferred maintenance backlog by different amounts.

Deferred maintenance cost is the future cost for deferring maintenance that should be performed now. Under the current funding planned for the City's pavement projects the anticipated deferred maintenance cost for the pavement will increase to $31.7 million dollars over the next six years. The previous presentation showed how by following a best practices pavement management program the City may maintain current roadways that are in Good condition and keep them from declining further. Funding is inadequate to prevent roadways that are in Satisfactory and Fair condition from declining and roadways in Poor condition from declining even further.

The City of Belmont employs the Metropolitan Transportation Commission (MTC) Streetsaver Program in evaluating how the City may best utilize limited City funds for paving projects. The program allows the City to evaluate deferred maintenance cost for different multi year funding scenarios. Program results are based on the Pavement Condition Index (PCI). MTC requires the City to evaluate four different funding scenarios, from the optimum alternative that completely eliminates deferred maintenance cost to the proposed funding plan for the City.

The cost for each scenario is presented with the evaluation of how increased funding level affects overall condition of city streets. Two conceptual approaches to improve street conditions in the long run are presented for consideration of whether or not full and detailed implementation plans should be developed for either of the alternative approaches described herein.

Discussion

In January, the Council heard detailed information regarding the evaluation of City roadways, and how the data compiled is used to determine recommendations for slurry sealing, overlay, and reconstruction of roadways. The previous presentation looked at two funding scenarios, at each end of the potential range of improvement levels. This presentation will look at two additional scenarios that are between the high and low end of the range of options. A summary of the previous terminology and the most cost effective treatment approach is as follows.

Pavement Condition Index

MTC's pavement condition index (PCI) is a ranking system that assesses, weighs, and combines various defects to give an overall indication of the pavement condition. The PCI scale runs from 0 to 100 as follows:

70 to 100	Good – Pavement is in fairly sound condition. There are very few cracks and little to no raveling.
50 to 70	Satisfactory – Pavements show some form of distress caused by traffic load or environmental distress that require more than a life-extending treatment. .
25 to 49	Fair – AC layer is failing and requires thick overlay or reconstruction.
0 to 24	Poor – Entire structural section has failed and the pavement and the sub-base require reconstruction.

The PCI is a quick method of comparing the overall condition of pavement and magnitude of rehabilitation needs. It does not provide sufficient information to describe the types, causes, and remedies for specific defects in a street segment.

Extending Pavement Life through Maintenance and Rehabilitation

Pavement life can be extended at relatively low cost by timely maintenance and rehabilitation. New pavement holds its good condition for a long period, but once it begins to fail, its condition drops rapidly. Pavement is at the onset of rapid failure when its condition drops into the 70 to 55 PCI range. MTC's recommended strategy is to prioritize funding to hold all Good condition street segments at that level while using remaining available funds to rebuild poorer condition pavement. This approach allows communities to maintain their pavement with the lowest ongoing cost and is the most cost effective use of limited funds.

City of Belmont Pavement Condition – Current Condition

The City's most recent pavement assessment was completed in November 2007. The 2007 assessment showed that the overall average PCI for Belmont streets is 61, placing them in the mid-range of the Satisfactory category. MTC reports that the overall average Bay Area PCI is 65 and Belmont is 15 out of the 19 jurisdictions in San Mateo County.

Roadways are categorized into three functional classifications. The three classifications are Arterial, Collector, and Local. Arterial roadways are the major streets in the City and Local roadways primarily serve residential neighborhoods. As shown in the following table, Belmont's Arterials are generally in Good condition. The Collectors and the Local streets are in Satisfactory condition on average, but are also entering the onset of rapid failure stage.

2008 Weighted Average PCI by Functional Classification

Classification	PCI	Good	Satisfactory	Fair	Poor	Lane Miles
Arterial	79	8%	2%	<1%	0%	14
Collector	65	17%	5%	6%	3%	35
Local/Residential	57	23%	13%	14%	9%	86
Total	**61**	**48%**	**20%**	**20%**	**12%**	**135**

Averaging PCIs over the entire City or functional class obscures the fact that individual street segment conditions range from excellent to failed. The majority of the failed roadways within the City are Local/Residential Roadways. The roadways in Poor condition are primarily Local roadways that do not have grant funding available for their repair.

The breakdown of all streets by condition category is shown below:

Existing Conditions
2008 - Condition Distribution

Condition Category	PCI Range	Percent	Lane Miles
Good	70 – 100	48%	63
Satisfactory	50 – 69	20%	27
Fair (Failing)	25 – 49	20%	27
Poor (Failed)	0 – 25	12%	18

Funding Scenarios

Four alternative funding scenarios will be presented to illustrate the effect of providing different levels of funding on the projected condition of City streets. The scenarios range from the lowest funding level, which is the level currently used for planning purposes, to the highest funding level which is an unconstrained funding level. The objectives of the four alternative scenarios are as follows.

- Current Investment Level Budget: This scenario shows the impact the current $415,000 yearly investment level budget for six years. This is a sustainable amount that is utilized for planning purposes. Because of instability and uncertainty in the State budget and reliance on grant funding actual amount vary year to year.

- Cost to Maintain the Current PCI: This scenario estimates the funding needed to maintain the pavement condition at its current level for six years.

- Cost to Increase PCI by Five Points - Six and Ten Year Investment Level: This two part scenario examines the investment level required to increase the current average PCI of 61 by five (5) points to 66 over the next six and over the next ten years.

- Cost to Attain Optimum PCI of 80 to 85: This scenario shows the effects of implementing the ideal investment strategy. Because it is more cost-effective in the long run to eliminate the deferred maintenance backlog as quickly as possible, the bulk of the maintenance needs are addressed in the first year of the six year program.

These scenarios roughly bracket the range of worst to best alternatives.

Current Investment Level Budget

At current estimated funding levels of $415,000 per year, the overall PCI will drop several points per year to 53 in 2013. The deferred maintenance and rehabilitation backlog will grow from $14 million to $31.7 million.

The breakdown of all streets by condition category in 2013 under current funding is shown below:

Scenario - Current Funding Level 2013 - Condition Distribution			
Condition Category	**PCI Range**	**Percent**	**Lane Miles**
Good	70 – 100	46.0%	65
Satisfactory	50 – 69	13.7%	18
Fair (Failing)	25 – 49	13.3%	18
Poor (Failed)	0 – 25	27.0%	34

Current funding levels are sufficient to keep the City's Good condition pavement in Good condition through slurry seal and thin overlay. The current funding levels are not sufficient to keep the roadways that are in Satisfactory, Fair (failing), or Poor (failed) condition from declining. At current funding levels an additional 15% of the City roadway system will have fallen into Poor condition and Failed by 2013. A full 40% of the City roadway system will be failing or will have already failed under this scenario by 2013.

Cost to Maintain Current PCI of 61

This scenario estimates the funding needed to maintain the pavement condition at its current level for six years. The minimum cost to maintain the City's current average PCI of 61 over the next six years is approximately $1.2 million per year. This scenario reduces the backlog of

deferred maintenance, but it will still grow to $28 million over the next six years.

The breakdown of all streets by condition category in 2013 under this funding scenario is as follows:

Scenario - Maintain PCI of 61 2013 - Condition Distribution			
Condition Category	**PCI Range**	**Percent**	**Lane Miles**
Good	70 – 100	64.9%	88
Satisfactory	50 – 69	6.7%	9
Fair (Failing)	25 – 49	2.4%	3
Poor (Failed)	0 – 25	26%	35

The increase in funding provides adequate funds to also bring many roadways that are in Satisfactory condition into the Good range. The funds are not sufficient to perform the more expensive work needed to prevent roadways already in Fair condition from deteriorating further. At this funding level, the aggregate average can be held to a PCI of 61, but the street condition distribution shifts. A significant percentage of roadways will have their condition improved to the Good category where there ongoing maintenance costs are minimized. A similar percentage of roadways will continue to fail, falling into the more expensive "full reconstruction" remedial range. Under this scenario, an additional 14 percent of the City roadway system will have fallen into Poor condition and failed by 2013. A total of 28 percent of the City roadway system will be failing or will have already failed by 2013 rather than the 40 percent under the current funding scenario.

<u>Cost to Increase PCI by Five PCI Points - Six and Ten year Investment Level</u>

An annual budget level of $2.2 million in each year of the six (6) year period for a total of $12.9 million is required to raise the PCI to 66 over six years. The cost of deferred maintenance in the year 2013 will total approximately $23.5 million.

An annual budget level of $2 million in each year of the ten (10) year period for a total of $19.7 million is required to raise the PCI to 66 over ten years. The cost of deferred maintenance in the year 2017 will total approximately $26 million.

A PCI of 66, which is in the "satisfactory" condition category, is a moderately low service level and target PCI to maintain long term. The City is still left with a considerable amount of deferred maintenance, for which there are very few maintenance and rehabilitation alternatives, and those alternatives are costly. This scenario illustrates the benefit of making improvements earlier in the pavement deterioration cycle. Even at this funding level the rate of deterioration does not completely stabilize, though the rate of increase does slow after 2012.

The breakdown of all streets by condition category in 2013 and in 2027 under this funding scenario is as follows:

Scenario – Increase PCI by Five PCI Points (Six Years) 2013 - Condition Distribution			
Condition Category	**PCI Range**	**Percent**	**Lane Miles**
Good	70 – 100	75.9%	102
Satisfactory	50 – 69	0.5%	0.5
Fair (Failing)	25 – 49	0.8%	1.5
Poor (Failed)	0 – 25	22.8%	31
Scenario - Increase PCI by Five PCI Points (Ten Years) 2017 - Condition Distribution			
Condition Category	**PCI Range**	**Percent**	**Lane Miles**
Good	70 – 100	78.3%	106
Satisfactory	50 – 69	1.8%	2
Fair (Failing)	25 – 49	0%	0
Poor (Failed)	0 – 25	19.9%	27

An additional 10% of City streets would still deteriorate into the range where there condition is Poor, and they have failed. Approximately 20% of City streets will still fail under this funding scenario. The bulk of the remaining roadways would be in Good condition.

Cost to Attain Optimum PCI of 80 to 85

MTC's pavement management goal is for all agencies to raise and maintain their pavement PCI into the 80 to 85 range, as this yields the lowest long-term maintenance cost. It would cost Belmont about $31 million over the next six years to improve the condition of its pavement from the current 61 to the optimum 80 to 85. This would eliminate the current $14 million backlog of deferred maintenance and rehabilitation and would aggressively address anticipated maintenance needs. This scenario analyzes the cost for 100% of the network to be improved to Good condition by the year 2013.

The cost of construction associated with this alternative is examined in great detail, as it illustrates the cost to perform all of the work that would be needed to bring the City roadways up to an optimum level. This analysis also provides a picture of all of the different types of work that needs to be done. This gives a breakdown of what a complete maintenance program for City

streets over the next six years would look like.

The cost breakdown by functional classification is as follows:

Functional Class	Lane Miles	Preventative Maintenance Needs	Rehabilitation Needs	Total Needs
Arterial	13	$365,000	$2,145,000	$2,510,000
Collector	35	$495,000	$7,520,000	$8,015,000
Residential	87	$495,000	$20,400,000	$20,895,000
Total	135	$1,355,000	$30,065,000	$31,420,000

These costs are for the pavement component of street improvements only. They do not include other improvements such as slope stabilization, drainage, traffic flow improvements, or pavement markings and signage.

The breakout of recommended preventative maintenance and rehabilitation is as follows:

Maintenance By Type		
Preventative Maintenance	Square Yards	Cost
Slurry Seal	374,526	$1,299,150
Crack Seal (linear foot)	15,263	$24,705
Mill and Thin Overlay	1,906	$32,203
Maintenance Subtotal		$1,356,058
Rehabilitation		
Patch and Slurry Seal	132,657	$840,445
AC Overlay	143,327	$4,736,096
Mill and Thick AC Overlay	72,916	$2,356,250
Reconstruct Structure	269,495	$22,135,164
Rehabilitation Subtotal		$30,067,955
Total		$31,424,013

Belmont would need to complete a significant amount of pavement reconstruction, primarily in residential neighborhoods, where Local roadways are located, to attain an overall PCI in the 80 to 85 range.

Maximizing Existing Resources

There are several approaches the City might take to more effectively address the condition of pavement in the City and address paving needs.

One approach would be to develop additional funding to pay for the proposed work. This could be accomplished through the creation of a new City-wide property assessment or tax to fund the

proposed program for paving. This is the approach needed if the City is to address the needs of Local roadways that require reconstruction or expensive thick overlay. If the Council wishes this alternative pursued, for any of the scenarios presented or for other alternatives such as to perform only the more expensive reconstruction work, we could perform the analysis to develop further information on the proposed funding alternatives for consideration.

The City could also continue to approach on a roadway by roadway basis. Grant funding will be pursued to fund improvements to Arterial and Collector Roadways. Redevelopment Funds will be used to fund improvement to roadways within the redevelopment area. Consideration will be given to the formation of local assessment districts to fund specific improvements where requested by the local residents.

On a regional level, efforts are underway to secure additional funding for roadway improvements. MTC is currently investigating a gas tax that would provide dedicated funding for local streets and roads.

A complementary approach would be to bring the work of providing slurry sealing in-house and have Public Works Services staff perform the work. City staff has conceptually explored this approach, and it appears there would be some benefit to the City.

One advantage to this approach is that soft costs such as cost for staff to prepare detailed plans, specifications, and estimates (PS&E) and cost to advertise, award, and perform construction oversight of the contract is eliminated. There would not be a complete elimination of soft cost, as Engineering and Services staff would still need to perform planning and field evaluation of roadways in order to perform construction in house. In addition, any paving projects for overlay or reconstruction would still need to be constructed by a contractor hired through the competitive bidding process.

In the City 2007 paving program, a greater economy of scale was achieved by aggregating funds from several years and performing construction of one larger construction project rather than construction of a smaller project each year preceding. In the summer of 2007, the City of Belmont completed $700,754 Slurry and Pavement projects as a part of two separate contracts. Performance of the work by in-house staff would eliminate the need to aggregate funds from several years, in order to achieve the economy of scale needed to secure a competitive unit price for the work. With an in house maintenance program slurry work could be ongoing.

In order to proceed with this alternative, there would be an initial start up cost. The cost of a new slurry seal truck is $275,000.00. The cost for the equipment would come from Fleet

Management Funds. There would also be staffing associated with this approach. In order to maintain other service programs, this would require the hiring of two additional staff persons in the Services
Division. The cost for two additional field staff members is $75,000.0 per year per employee. Funding for staff cost for street maintenance activities would come from the Gas Tax.

A cost saving is anticipated as well as a reduction in the lead time needed to perform work. The estimated cost for construction for this program is estimated to be much less than should the City perform the work using contractors. It is estimated that City staff would be able to apply slurry seal to all of the roadways requiring preventative maintenance as well as perform the base repair and slurry sealing of roadways requiring slurry rehabilitation treatment, as outlined by the Streetsaver program. It is estimated that this level of work could be completed within the current overlay budget under the Streets Maintenance and Capital Improvement budget over four years or less. This represents rehabilitation through slurry seal of 50 percent of the total square yardage of our pavement maintenance needs.

The City assumes for planning and budgeting purposes that $415,000 per year will be spent on pavement projects. This is a conservative and reliable amount to use for planning purposes, but because of lack of stability in State funding, the amount of funds available fluctuates from year to year. The current budget includes funds for contracts for slurry seal and asphalt concrete pavement overlay projects in the amount of $640,000 (including Old County Road and RDA funding to supplement Measure A and Proposition 1B funds available for paving) are planned. Use of grant and redevelopment funds for pavement projects greatly enhances the baseline program.

The Old County Road paving project is grant funded and scheduled for completion this year. Additional Redevelopment Agency funds will be used to supplement the original grant amount. Because of the passage of time since the original grant was secured the cost to repair the pavement on Old County Road has increased. The scope of necessary work has increased due to pavement deterioration and has increased due to inflation. The remaining funds will be used for paving projects recommended by the Street Saver Program.

General Plan/Vision Statement

The City's Pavement Management Program is consistent with the General Plan. The Circulation Element, Description of Trafficways (Paragraph 2103) notes that there are a number of streets with substandard pavement condition and that the ongoing phased street overlay program will improve pavement condition and extend the life of existing streets.

Fiscal Impact

There is no fiscal impact from this informational report.

Public Contact

The Council agenda was posted.

Recommendation
Staff recommends that Council provide discussion and direction.

Alternatives
1. Take no action.
2. Refer back to staff for further information.

Attachments
None

Respectfully submitted,

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